由于NTP而排除DHCP监听数据库完整性故障

目录

简介

本文档介绍NTP与DHCP监听数据库之间的关系，重点介绍记录和恢复DHCP绑定中的时间同步。

先决条件

要求

Cisco 建议您了解以下主题：

基本了解：

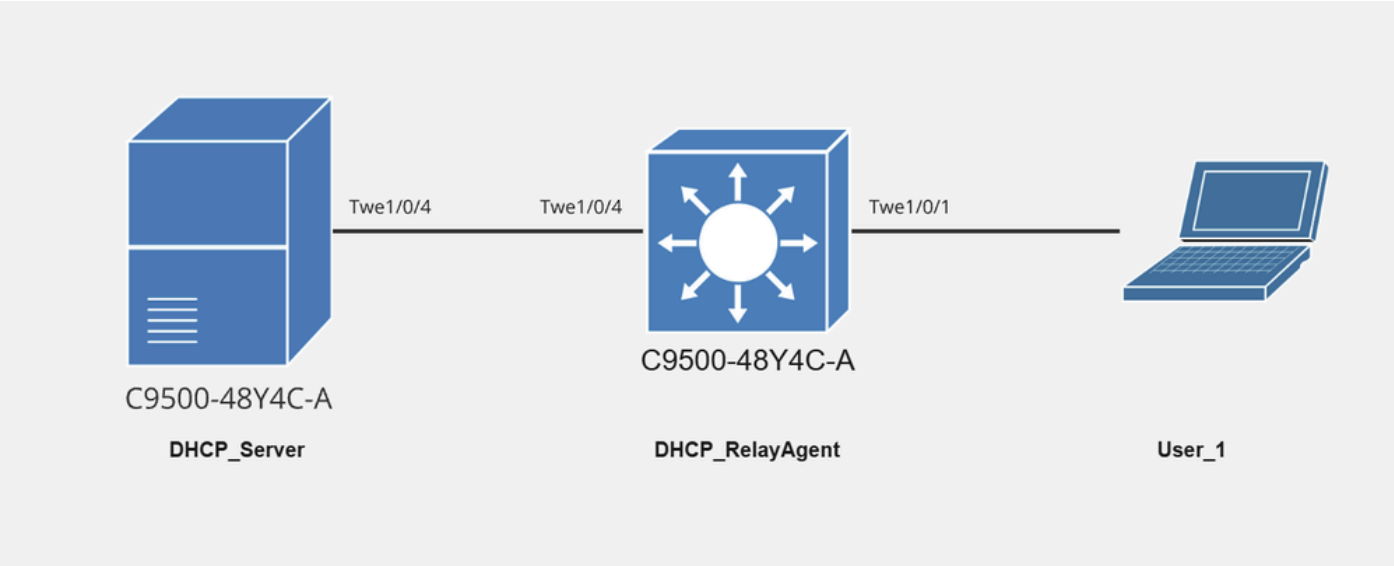
- Catalyst 9000系列交换机架构
- Cisco IOS® XE软件和命令行
- DHCP（动态主机配置协议）、DHCP监听及相关功能
- NTP（网络时间协议）

使用的组件

本文档中的信息基于Cisco IOS®软件版本17.12.4上的Cisco Catalyst C9500。

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

拓扑



User_1的Network_Diagram

NTP和NTP可达性在DHCP监听数据库填充中的作用

在启用DHCP监听的交换机或网络设备中，绑定表保存有关IP地址、MAC地址、VLAN和租用到期时间的实时动态信息。此信息对于检验DHCP客户端和保护网络免受非法DHCP服务器攻击至关重要。

但是，监听数据库通常旨在为此信息提供持久性，以便在重新启动后恢复该信息。数据库可以定期备份，并且信息存储在持久文件中（例如，flash:backup.text）。为了让此备份过程正常运行，需要精确的系统时间，特别是对于租用到期时间戳和其他时间敏感型数据。

NTP是确保系统时钟准确同步的关键。系统依靠准确的时间来：

- 计算DHCP绑定的租用期限。
- 确保在保存绑定表时，将正确的时间戳写入监听数据库。

如果NTP服务器无法访问，或者系统无法同步其时钟，则系统不能有准确的时间参考来正确处理DHCP租用的到期时间戳。这会导致以下问题：

1.租约到期时间问题

错误的时间戳可能会导致以下问题：

- 租赁到期或续期不正确。
- 监听数据库中过时或过时的DHCP绑定信息。

2.对绑定表备份的影响

当NTP服务器可访问时，系统可以为每个DHCP租用生成准确的时间戳，并将绑定表正确备份到监听数据库中。

如果NTP服务器无法访问，设备将无法确定正确的当前时间，从而导致尝试向数据库中写入有效绑定信息为0。

3.不可靠的数据库备份

监听数据库永久存储绑定信息，包括每个租约的到期时间。

如果没有来自NTP的准确系统时间，设备在保存到数据库时无法写入准确的租用到期时间戳。

如果NTP服务器可间歇性地访问，则会导致DHCP绑定表和DHCP监听数据库表之间的完整性问题。因此，监听数据库数据被视为不完整或不正确。

基本配置

步骤1.在中继代理上全局启用DHCP监听，并在VLAN下启用DHCP监听。在这种情况下，中继代理和接入交换机是相同的。

```
DHCP_RelayAgent#configure terminal
DHCP_RelayAgent(config)#ip dhcp snooping
DHCP_RelayAgent(config)#ip dhcp snooping vlan 10
```

步骤2.在交换机的所有接口上配置从正版DHCP服务器接收DHCP提供的信任DHCP监听。此类接口的数量取决于DHCP服务器的网络设计和位置。这些是指向正版DHCP服务器的接口。

<#root>

DHCP_RelayAgent# show running-configuration interface TwentyFiveGigE1/0/4

```
Building configuration...
Current configuration : 84 bytes
!
interface TwentyFiveGigE1/0/4
 switchport mode trunk
 ip dhcp snooping trust
end
```

步骤3.将DHCP监听数据库配置为某个位置，以监视DHCP监听绑定表、跟踪数据库操作的运行状况并验证数据库是否正确更新和传输。

<#root>

```
DHCP_RelayAgent#configure terminal
DHCP_RelayAgent(config)#ip dhcp snooping database bootflash:dhcpsnoopingdatabase.txt
```

```
DHCP_RelayAgent(config)#ip dhcp snooping database timeout 300
DHCP_RelayAgent(config)#ip dhcp snooping database write-delay 15
```

```
DHCP_RelayAgent#show running-configuration | include database
```

```
ip dhcp snooping database bootflash:dhcpsnoopingdatabase.txt
ip dhcp snooping database write-delay 15
```

场景1 - NTP服务器无法访问

<#root>

```
DHCP_RelayAgent# ping vrf Mgmt-vrf 10.81.254.131
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.81.254.131, timeout is 2 seconds:
……
Success rate is 0 percent (0/0)
```

现在，我们可以看到User_1在vlan 10中收到了IP 10.10.10.1。

这是DHCP监听绑定表，显示TwentyFiveGigE1/0/1上User_1的IP地址、MAC地址和接口

<#root>

```
DHCP_RelayAgent#show ip dhcp snooping binding
```

```
MacAddress          IpAddress        Lease(sec)    Type           VLAN   Interface
------------------  ---------------  ----------   --------------  ----   --------------------
78:BC:1A:0B:D5:1F   10.10.10.1       86372        dhcp-snooping   10     TwentyFiveGigE1/0/1

Total number of bindings: 1
```

通常，一旦用户接收到IP地址，动态创建监听绑定表，随后将相应信息添加到监听数据库。但是，在本例中，由于NTP服务器无法访问，因此总共尝试更新绑定信息或将绑定信息传输到数据库为0次。

<#root>

```
DHCP_RelayAgent#show ip dhcp snooping database
```

Agent URL : bootflash:dhcpsnoopingdatabase.txt
Write delay Timer : 15 seconds
Abort Timer : 300 seconds

Agent Running : No
Delay Timer Expiry : Not Running
Abort Timer Expiry : Not Running

Last Succeded Time : 18:37:38 UTC Mon Mar 17 2025
Last Failed Time : None
Last Failed Reason : No failure recorded.

Total Attempts : 0

Startup Failures : 0

Successful Transfers : 0

Failed Transfers : 0
Successful Reads : 0 Failed Reads : 0

Successful Writes : 0

Failed Writes : 0
Media Failures : 0

<#root>

DHCP_RelayAgent#more flash:dhcpsnoopingdatabase.txt

%Error opening bootflash:dhcpsnoopingdatabase.txt (No such file or directory)

<#root>

*Mar 18 11:12:21.264: DHCP_SNOOPING: process new DHCP packet, message type: DHCPACK, input interface: Vl
*Mar 18 11:12:21.264: DHCP_SNOOPING: binary dump of option 82, length: 20 data:
0x52 0x12 0x1 0x6 0x0 0x4 0x0 0xA 0x1 0x1 0x2 0x8 0x0 0x6 0x78 0xBC 0x1A 0xB 0xC2 0x60
*Mar 18 11:12:21.264: DHCP_SNOOPING: binary dump of extracted circuit id, length: 8 data:
0x1 0x6 0x0 0x4 0x0 0xA 0x1 0x1
*Mar 18 11:12:21.264: DHCP_SNOOPING: binary dump of extracted remote id, length: 10 data:
0x2 0x8 0x0 0x6 0x78 0xBC 0x1A 0xB 0xC2 0x60
*Mar 18 11:12:21.264: actual_fmt_cid OPT82_FMT_CID_VLAN_MOD_PORT_INTF global_opt82_fmt_rid OPT82_FMT_RID
*Mar 18 11:12:21.264: DHCP_SNOOPING: opt82 data indicates local packet
*Mar 18 11:12:21.264: DHCP_SNOOPING: opt82 data indicates local packet
*Mar 18 11:12:21.264: DHCP_SNOOPING opt82_fmt_cid_intf OPT82_FMT_CID_VLAN_MOD_PORT_INTF opt82_fmt_cid_gl
*Mar 18 11:12:21.264: DHCP_SNOOPING: vlan_id 10 VNI 0 mod 1 port 1
*Mar 18 11:12:21.264: DHCP_SNOOPING: mod 1 port 1 idb Twe1/0/1 found for 78bc.1a0b.d51f
*Mar 18 11:12:21.264: DHCP_SNOOPING: add binding on port TwentyFiveGigE1/0/1 ckt_id 0 TwentyFiveGigE1/0/
*Mar 18 11:12:21.264: DHCP_SNOOPING: dhcp binding entry already exists, update binding lease time to (86

*Mar 18 11:12:21.264: ipaddr: 10.10.10.1, hwidb: TwentyFiveGigE1/0/1, type: 1, phyidb: TwentyFiveGigE1/0

```
*Mar 18 11:12:21.264: DHCP_SNOOPING: Reroute dhcp pak, message type: DHCPACK
*Mar 18 11:12:21.264: DHCP_SNOOPING: remove relay information option.
*Mar 18 11:12:21.264: DHCP_SNOOPING opt82_fmt_cid_intf OPT82_FMT_CID_VLAN_MOD_PORT_INTF opt82_fmt_cid_gl
*Mar 18 11:12:21.264: DHCP_SNOOPING: vlan_id 10 VNI 0 mod 1 port 1
*Mar 18 11:12:21.264: DHCP_SNOOPING: mod 1 port 1 idb Twe1/0/1 found for 78bc.1a0b.d51f
*Mar 18 11:12:21.264: DHCP_SNOOPING: calling forward_dhcp_reply
*Mar 18 11:12:21.264: platform lookup dest vlan for input_if: Vlan10, is NOT tunnel, if_output: Vlan10,
*Mar 18 11:12:21.264: DHCP_SNOOPING opt82_fmt_cid_intf OPT82_FMT_CID_VLAN_MOD_PORT_INTF opt82_fmt_cid_gl
*Mar 18 11:12:21.264: DHCP_SNOOPING: vlan_id 10 VNI 0 mod 1 port 1
*Mar 18 11:12:21.264: DHCP_SNOOPING: mod 1 port 1 idb Twe1/0/1 found for 78bc.1a0b.d51f
*Mar 18 11:12:21.264: DHCP_SNOOPING: vlan 10 after pvlan check
*Mar 18 11:12:21.264: DHCP Memory dump is printed for direct forward reply

765DFA772750: FFFF FFFFFFFF 78BC1A0B C2FF0800
765DFA772760: 4500015E 00230000 FF11A64E 0A0A0A14
765DFA772770: FFFFFFFF 00430044 014A36A8 02010600
765DFA772780: BAF1E48A 00008000 00000000 0A0A0A01
765DFA772790: 00000000 0A0A0A14 78BC1A0B D51F0000
765DFA7727A0: 00000000 00000000 00000000 00000000
765DFA7727B0: 00000000 00000000 00000000 00000000
765DFA7727C0: 00000000 00000000 00000000 00000000
765DFA7727D0: 00000000 00000000 00000000 00000000
765DFA7727E0: 00000000 00000000 00000000 00000000
765DFA7727F0: 00000000 00000000 00000000 00000000
765DFA772800: 00000000 00000000 00000000 00000000
765DFA772810: 00000000 00000000 00000000 00000000
765DFA772820: 00000000 00000000 00000000 00000000
765DFA772830: 00000000 00000000 00000000 00000000
765DFA772840: 00000000 00000000 00000000 00000000
765DFA772850: 00000000 00000000 00000000 00000000
765DFA772860: 00000000 00000000 63825363 3501053D
765DFA772870: 1A006369 73636F2D 37386263 2E316130
765DFA772880: 622E6435 31662D56 6C313036 040A0A0A
765DFA772890: 0A330400 0151803A 040000A8 C03B0400
765DFA7728A0: 01275001 04FFFFFF 00FF0000 00000000
765DFA7728B0: 00000000 00000000 00000000 00FF
*Mar 18 11:12:21.273: DHCP_SNOOPING: direct forward dhcp replyto output port: TwentyFiveGigE1/0/1.

*Mar 18 11:12:38.546: Write delay timer expired


*Mar 18 11:12:38.546: Restarting write delay timer.


*Mar 18 11:13:38.546: Write delay timer expired


*Mar 18 11:13:38.546: Restarting write delay timer.


*Mar 18 11:14:08.547: Write delay timer expired


*Mar 18 11:14:08.547: Restarting write delay timer.


*Mar 18 11:14:14.266: %SYS-5-CONFIG_I: Configured from console by admin on vty0 (10.110.129.206)
```

场景2 — 可访问NTP服务器

<#root>

DHCP_RelayAgent# ping vrf Mgmt-vrf 10.81.254.131

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.81.254.131, timeout is 2 seconds:
!!!!!
```

Success rate is 100 percent (5/5), round-trip min/avg/max = 175/175/176 ms

<#root>

DHCP_RelayAgent#show ip dhcp snooping binding

MacAddress	IpAddress	Lease(sec)	Type	VLAN	Interface
78:BC:1A:0B:D5:1F	**10.10.10.1**	**86372**	**dhcp-snooping**	**10**	**TwentyFiveGigE1/0/1**

```
Total number of bindings: 1
```

用户收到IP地址后，会动态创建监听绑定表，并将相应信息添加到监听数据库中。因此，更新或传输数据库的总尝试次数为1次，全部成功。没有失败的写入、读取或传输。

<#root>

DHCP_RelayAgent#show ip dhcp snooping database

```
Agent URL : bootflash:dhcpsnoopingdatabase.txt
Write delay Timer : 15 seconds
Abort Timer : 300 seconds

Agent Running : No
Delay Timer Expiry : 29 (00:00:29)
Abort Timer Expiry : Not Running

Last Succeded Time : 18:39:27 UTC Mon Mar 17 2025
Last Failed Time : None
Last Failed Reason : No failure recorded.
```

Total Attempts : 1

```
         Startup Failures : 0
```

```
Successful Transfers : 1

   Failed Transfers : 0
Successful Reads : 0       Failed Reads : 0


Successful Writes : 1

      Failed Writes : 0
Media Failures : 0
```

<#root>

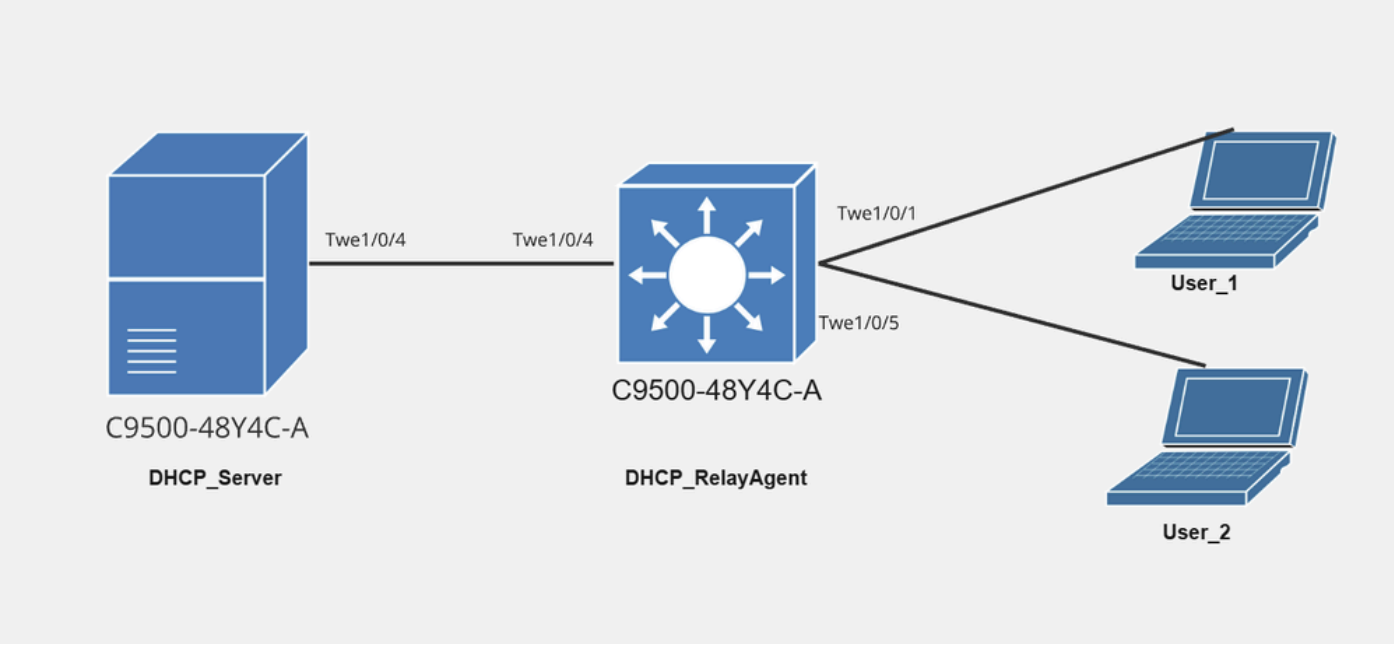
```
DHCP_RelayAgent#more flash:dhcpsnoopingdatabase.txt


67d86a58
TYPE DHCP-SNOOPING
VERSION 1
BEGIN

10.10.10.1    10    78bc.1a0b.d51f    67D9BBCA    Twe1/0/1    8b21f6ef


END
```

场景3 - NTP服务器可间歇访问



使用User_1和User_2的网络图

<#root>

```
DHCP_RelayAgent# ping vrf Mgmt-vrf 10.81.254.131
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.81.254.131, timeout is 2 seconds:
!!!!!
```

Success rate is 100 percent (5/5), round-trip min/avg/max = 175/175/176 ms

现在，我们可以看到User_1在vlan 10中收到了IP 10.10.10.1。

这是DHCP监听绑定表，显示TwentyFiveGigE1/0/1上User_1的IP地址、MAC地址和接口

<#root>

DHCP_RelayAgent#show ip dhcp snooping binding

```
MacAddress IpAddress Lease(sec) Type VLAN Interface
------------------ -------------- ---------- ------------ ---- --------------------
```

78:BC:1A:0B:D5:1F 10.10.10.1 86372 dhcp-snooping 10 TwentyFiveGigE1/0/1

```
Total number of bindings: 1
```

<#root>

DHCP_RelayAgent#show ip dhcp snooping database

```
Agent URL : bootflash:dhcpsnoopingdatabase.txt
Write delay Timer : 15 seconds
Abort Timer : 300 seconds

Agent Running : No
Delay Timer Expiry : 29 (00:00:29)
Abort Timer Expiry : Not Running

Last Succeded Time : 18:40:20 UTC Mon Mar 17 2025
Last Failed Time : None
Last Failed Reason : No failure recorded.
```

Total Attempts : 1

```
         Startup Failures : 0
```

Successful Transfers : 1

```
   Failed Transfers : 0
Successful Reads : 0       Failed Reads : 0
```

Successful Writes : 1

```
      Failed Writes : 0
Media Failures : 0
```

<#root>

```
DHCP_RelayAgent#more flash:dhcpsnoopingdatabase.txt

67d86a58
TYPE DHCP-SNOOPING
VERSION 1
BEGIN
10.10.10.1  10  78bc.1a0b.d51f  67D9BBCA  Twe1/0/1  8b21f6ef

END
```

过了一段时间，NTP无法访问，但User_2在vlan 10中获得其IP地址10.10.10.2，它在绑定表中更新，但未推入监听数据库表。

<#root>

```
DHCP_RelayAgent# ping vrf Mgmt-vrf 10.81.254.131

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.81.254.131, timeout is 2 seconds:
……
Success rate is 0 percent (0/0)
```

这是DHCP监听绑定表，显示了TwentyFiveGigE1/0/5上User_2的IP地址、MAC地址和接口

<#root>

```
DHCP_RelayAgent#show ip dhcp snooping binding

MacAddress          IpAddress        Lease(sec)   Type           VLAN   Interface
------------------  ---------------  ----------   -------------  ----   --------------------
78:BC:1A:0B:D5:1F   10.10.10.1       86217        dhcp-snooping  10     TwentyFiveGigE1/0/1

F8:E5:7E:75:04:46   10.10.10.2       85336        dhcp-snooping  10     TwentyFiveGigE1/0/5
Total number of bindings: 2
```

监听数据库中的条目不会增加，成功写入的总数仍为1。

<#root>

DHCP_RelayAgent#show ip dhcp snooping database

```
Agent URL : bootflash:dhcpsnoopingdatabase.txt
Write delay Timer : 15 seconds
Abort Timer : 300 seconds

Agent Running : No
Delay Timer Expiry : 29 (00:00:29)
Abort Timer Expiry : Not Running

Last Succeded Time : 18:41:38 UTC Mon Mar 17 2025
Last Failed Time : None
Last Failed Reason : No failure recorded.
```

Total Attempts : 1

```
         Startup Failures : 0
```

Successful Transfers : 1

```
   Failed Transfers : 0
Successful Reads : 0       Failed Reads : 0
```

Successful Writes : 1

```
      Failed Writes : 0
Media Failures : 0
```

<#root>

DHCP_RelayAgent#more flash:dhcpsnoopingdatabase.txt

```
67d86a58
TYPE DHCP-SNOOPING
VERSION 1
BEGIN
```

10.10.10.1 10 78bc.1a0b.d51f 67D9BBCA Twe1/0/1 8b21f6ef

```
END
```

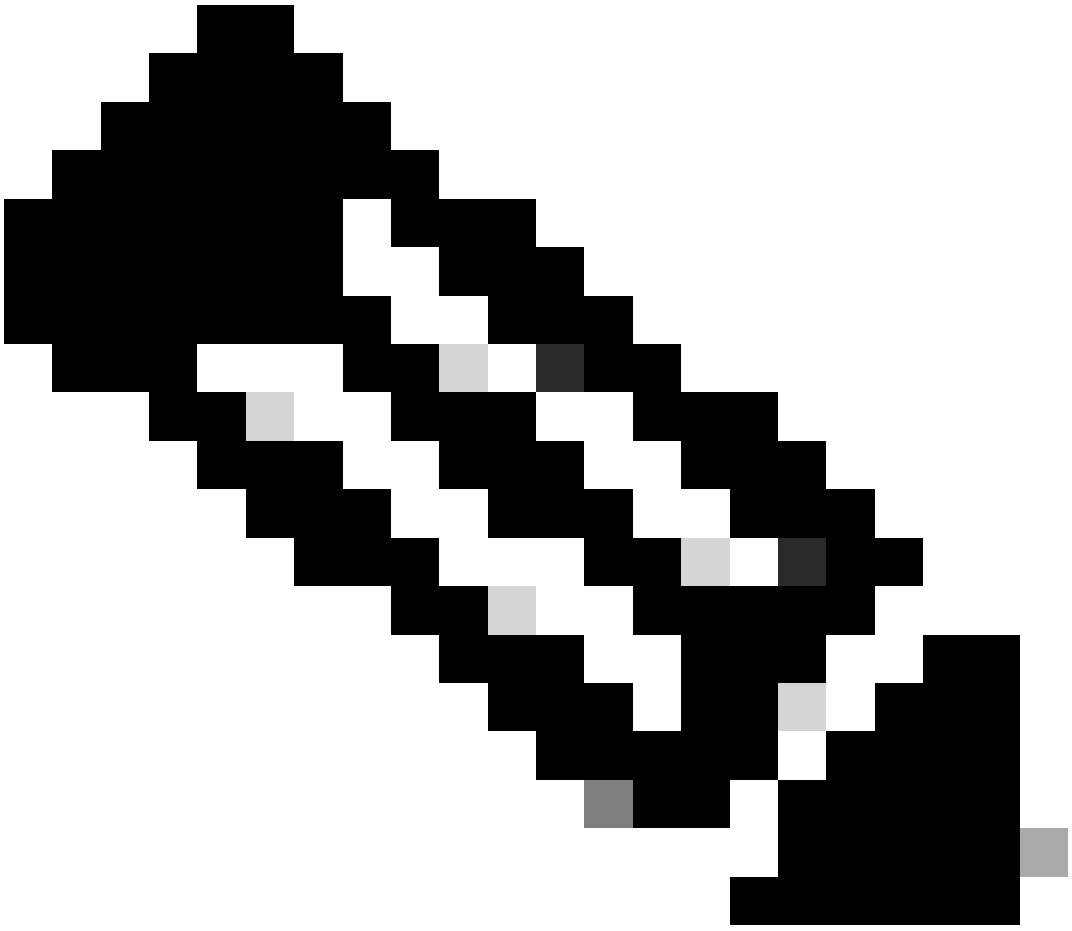
当NTP服务器变得可访问时，系统会同步DHCP监听绑定表和DHCP监听数据库。此处不显示此场景。但是，通过删除NTP服务器配置也可以获得类似的结果。

删除NTP配置后，User_2条目将添加到监听数据库表中。
在这种情况下，交换机使用系统的时钟时间。

<#root>

DHCP_RelayAgent#configure terminal

DHCP_RelayAgent(config)# no ntp server 10.81.254.131



注意：出于演示目的，我们删除了NTP服务器配置。从技术上讲，NTP服务器可访问和NTP服务器未配置的结果是类似的。

```
*Mar 17 17:26:26.475: %DHCP_SNOOPING-4-NTP_NOT_RUNNING: NTP is not running; reloaded binding lease expir
*Mar 17 17:26:26.486: %DHCP_SNOOPING-6-AGENT_OPERATION_SUCCEEDED: DHCP snooping database Write succeeded
```

<#root>

DHCP_RelayAgent#show ip dhcp snooping binding

```
MacAddress          IpAddress        Lease(sec)   Type           VLAN   Interface
```

```
-----------------   --------------  ----------   -------------   ----   --------------------
```

78:BC:1A:0B:D5:1F 10.10.10.1 86217 dhcp-snooping 10 TwentyFiveGigE1/0/1

F8:E5:7E:75:04:46 10.10.10.2 85336 dhcp-snooping 10 TwentyFiveGigE1/0/5

```
Total number of bindings: 2
```

<#root>

DHCP_RelayAgent#show ip dhcp snooping database

```
Agent URL : bootflash:dhcpsnoopingdatabase.txt
Write delay Timer : 15 seconds
Abort Timer : 300 seconds

Agent Running : No
Delay Timer Expiry : 29 (00:00:29)
Abort Timer Expiry : Not Running

Last Succeded Time : 18:42:16 UTC Mon Mar 17 2025
Last Failed Time : None
Last Failed Reason : No failure recorded.
```

Total Attempts : 2

```
         Startup Failures : 0
```

Successful Transfers : 2

```
    Failed Transfers : 0
Successful Reads : 0        Failed Reads : 0
```

Successful Writes : 2

```
       Failed Writes : 0
Media Failures : 0
```

<#root>

DHCP_RelayAgent#more flash:dhcpsnoopingdatabase.txt

```
67d86a58
TYPE DHCP-SNOOPING
VERSION 1
```

BEGIN

10.10.10.1 10 78bc.1a0b.d51f 67D9BBCA Twe1/0/1 8b21f6ef

10.10.10.2 10 f8e5.7e75.0446 67D9B6DC Twe1/0/5 bef43442

END

<#root>

```
*Mar 18 11:36:38.283: DHCP_SNOOPING: Reroute dhcp pak, message type: DHCPACK
*Mar 18 11:36:38.283: DHCP_SNOOPING: remove relay information option.
*Mar 18 11:36:38.283: DHCP_SNOOPING opt82_fmt_cid_intf OPT82_FMT_CID_VLAN_MOD_PORT_INTF opt82_fmt_cid_gl
*Mar 18 11:36:38.283: DHCP_SNOOPING: vlan_id 10 VNI 0 mod 1 port 1
*Mar 18 11:36:38.283: DHCP_SNOOPING: mod 1 port 1 idb Twe1/0/5 found for f8e5.7e75.0446
*Mar 18 11:36:38.283: DHCP_SNOOPING: calling forward_dhcp_reply
*Mar 18 11:36:38.283: platform lookup dest vlan for input_if: Vlan10, is NOT tunnel, if_output: Vlan10,
*Mar 18 11:36:38.283: DHCP_SNOOPING opt82_fmt_cid_intf OPT82_FMT_CID_VLAN_MOD_PORT_INTF opt82_fmt_cid_gl
*Mar 18 11:36:38.283: DHCP_SNOOPING: vlan_id 10 VNI 0 mod 1 port 1
*Mar 18 11:36:38.283: DHCP_SNOOPING: mod 1 port 1 idb Twe1/0/5 found for f8e5.7e75.0446
*Mar 18 11:36:38.283: DHCP_SNOOPING: vlan 10 after pvlan check
*Mar 18 11:36:38.283: DHCP Memory dump is printed for direct forward reply
765DFA80B990: FFFF FFFFFFFF 78BC1A0B C2FF0800
765DFA80B9A0: 4500015E 002B0000 FF11A646 0A0A0A14
765DFA80B9B0: FFFFFFFF 00430044 014A51AD 02010600
765DFA80B9C0: ED9296E4 00008000 00000000 0A0A0A01
765DFA80B9D0: 00000000 0A0A0A14 78BC1A0B D51F0000
765DFA80B9E0: 00000000 00000000 00000000 00000000
765DFA80B9F0: 00000000 00000000 00000000 00000000
765DFA80BA00: 00000000 00000000 00000000 00000000
765DFA80BA10: 00000000 00000000 00000000 00000000
765DFA80BA20: 00000000 00000000 00000000 00000000
765DFA80BA30: 00000000 00000000 00000000 00000000
765DFA80BA40: 00000000 00000000 00000000 00000000
765DFA80BA50: 00000000 00000000 00000000 00000000
765DFA80BA60: 00000000 00000000 00000000 00000000
765DFA80BA70: 00000000 00000000 00000000 00000000
765DFA80BA80: 00000000 00000000 00000000 00000000
765DFA80BA90: 00000000 00000000 00000000 00000000
765DFA80BAA0: 00000000 00000000 63825363 3501053D
765DFA80BAB0: 1A006369 73636F2D 37386263 2E316130
765DFA80BAC0: 622E6435 31662D56 6C313036 040A0A0A
765DFA80BAD0: 0A330400 0151803A 040000A8 C03B0400
765DFA80BAE0: 01275001 04FFFFFF 00FF0000 00000000
765DFA80BAF0: 00000000 00000000 00000000 00FF
*Mar 18 11:36:38.291: DHCP_SNOOPING: direct forward dhcp replyto output port: TwentyFiveGigE1/0/5.
*Mar 18 11:37:25.795: DHCP_SNOOPING: checking expired snoop binding entries
*Mar 18 11:37:36.694: %SYS-5-CONFIG_I: Configured from console by admin on vty0 (10.110.129.206)
*Mar 18 11:37:38.956: DHCPD: Reload workspace interface GigabitEthernet0/0 tableid 1.
*Mar 18 11:37:38.956: DHCPD: Sending notification of DISCOVER:
*Mar 18 11:37:38.956: DHCPD: htype 1 chaddr 7c21.0e1e.59b6
*Mar 18 11:37:38.956: DHCPD: table id 1 = vrf Mgmt-vrf
*Mar 18 11:37:38.956: DHCPD: interface = GigabitEthernet0/0
*Mar 18 11:37:38.956: DHCPD: class id 436973636f204e394b2d433933333243
*Mar 18 11:37:38.956: DHCPD: FSM state change INVALID
```

```
*Mar 18 11:37:38.956: DHCPD: Workspace state changed from INIT to INVALID
*Mar 18 11:37:39.957: DHCPD: Reload workspace interface GigabitEthernet0/0 tableid 1.
*Mar 18 11:37:39.957: DHCPD: Sending notification of DISCOVER:
*Mar 18 11:37:39.957: DHCPD: htype 1 chaddr 7c21.0e1e.59b6
*Mar 18 11:37:39.957: DHCPD: table id 1 = vrf Mgmt-vrf
*Mar 18 11:37:39.957: DHCPD: interface = GigabitEthernet0/0
*Mar 18 11:37:39.957: DHCPD: class id 436973636f204e394b2d433933333243
*Mar 18 11:37:39.957: DHCPD: FSM state change INVALID
*Mar 18 11:37:39.957: DHCPD: Workspace state changed from INIT to INVALID
```

***Mar 18 11:37:50.819: Write delay timer expired**

***Mar 18 11:37:50.819: Restarting write delay timer.**

***Mar 18 11:37:50.819: %DHCP_SNOOPING-4-NTP_NOT_RUNNING: NTP is not running; reloaded binding lease expir**

***Mar 18 11:37:50.827: to string : 10.10.10.1 10 78bc.1a0b.d51f 67DAAC45 Twe1/0/1**

***Mar 18 11:37:50.827: to string : 10.10.10.2 10 f8e5.7e75.0446 67D9B6DC Twe1/0/5**

***Mar 18 11:37:50.832: %DHCP_SNOOPING-6-AGENT_OPERATION_SUCCEEDED: DHCP snooping database Write succeeded**

***Mar 18 11:37:50.832: Resetting fail log parameters.**

结论

- 如果NTP服务器IP存在且可访问，则系统会填充DHCP监听绑定表和监听数据库。必须使用来自NTP服务器的同步时间为条目精确设置时间戳。
- 如果NTP服务器IP存在但无法访问，则仍会填充DHCP监听绑定表，但无法在监听数据库中填充条目，因为系统无法同步时间进行准确的租用管理。
- 如果NTP服务器IP未配置或不存在，则DHCP监听绑定表和监听数据库仍包含条目，但监听数据库中的时间戳不可靠，因为它们可能基于本地系统时间。
- 总之，为了准确可靠地管理DHCP监听数据库，NTP至关重要。

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